

Listing of Claims

This listing of claims will replace all prior versions, and listings, of the claims in this application.

Claim 1 (original): A method of displaying real-time, three-dimensional weather information, comprising:

generating, from data obtained from a first radar scan, a first representation of a weather event along a first plane;

generating, from data obtained from a second radar scan, a second representation of the weather event along a second plane, where the second plane is non-coplanar with the first plane;

combining the first and second representations to form a three-dimensional model of the weather event;

constructing a three-dimensional shape of the three-dimensional model; and
displaying the three-dimensional shape on a display.

Claim 2 (original): The method of claim 1, wherein the second plane is substantially orthogonal to the first plane.

Claim 3 (original): The method of claim 2, wherein the first radar scan is a first airborne radar scan, and wherein the second radar scan is a second airborne vertical radar scan performed at a bearing relative to the aircraft, said bearing corresponding to a predetermined part of the first representation.

Claim 4 (original): The method of claim 3, wherein the predetermined part is a center of the first representation.

Claim 5 (original): The method of claim 3, further comprising:

generating, from data obtained from a third airborne radar scan, a third representation of the weather event along a third plane, where the third plane is non-coplanar with the first and second planes;

combining the third representation with the first and second representations to update the three-dimensional model; and

updating the three-dimensional shape based on the updated three-dimensional model.

Claim 6 (original): The method of claim 5, wherein at least one of the second and third airborne radar scans are conducted in a substantially vertical plane that is substantially orthogonal to the first plane.

Claim 7 (original): A method of rendering, in an aircraft, a three-dimensional model of a weather event, comprising:

performing a first airborne radar scan across a first plane, where the first plane is generally horizontal;

extracting intensity data based upon reflectivity detected during the first radar scan;

generating a first shape descriptor that represents the weather event along the first plane;

determining a location of the weather event;

performing a second airborne radar scan across a second plane, where the first and second planes are substantially non-coplanar;

extracting intensity data based upon reflectivity detected during the second radar scan;

generating a second shape descriptor that represents the weather event along the second plane;

combining the first shape descriptor and the second shape descriptor to form a three-dimensional model of the weather event; and

constructing a three-dimensional shape from the three-dimensional model, wherein the three-dimensional shape is configured for display on an airborne display.

Claim 8 (original): The method of claim 7, wherein the second plane is generally horizontal and is generally parallel to the first plane.

Claim 9 (original): The method of claim 7, wherein the second plane is substantially orthogonal to the first plane.

Claim 10 (original): The method of claim 9, wherein the second airborne radar scan is performed in a predetermined direction relating to the location of the weather event.

Claim 11 (original): The method of claim 10, wherein the predetermined direction is obtained by

- calculating a center of the weather event along the first plane, and
- determining a bearing of the center relative to the aircraft, wherein the bearing is the predetermined direction.

Claim 12 (original): The method of claim 10, wherein the predetermined direction is obtained by

- determining a location in the weather event along the first plane corresponding to a level of intensity higher than other portions of the weather event, and
- determining the bearing of the location relative to the aircraft, wherein the bearing is the predetermined direction.

Claim 13 (original): The method of claim 7, further comprising:
performing a third airborne radar scan across a third plane, where the first, second and third planes are non-coplanar;
extracting intensity data based upon reflectivity detected during the third radar scan;
generating a third shape descriptor that represents the weather event along the third plane;
combining the third shape descriptor to the first and second shape descriptors to update the three-dimensional model of the weather event; and
updating the three-dimensional shape using the updated three-dimensional model.

Claim 14 (original): The method of claim 13, wherein at least one of the second and third planes are substantially orthogonal to the first plane.

Claim 15 (original): The method of claim 13, wherein at least one of the second and third planes are generally parallel to the first plane.

Claim 16 (original): The method of claim 7, further comprising rendering the three-dimensional shape on an airborne display, where the airborne display concurrently renders three-dimensional terrain information.

Claim 17 (original): The method of claim 7, wherein the three-dimensional model is formed in part by factoring in a change in volume of the weather event.

Claim 18 (original): The method of claim 7, wherein the three-dimensional model is supplemented by information from one of ground-based weather radar and weather information detected by another aircraft.

Claim 19 (original): An airborne weather radar system for obtaining and displaying real-time weather information in a three-dimensional format in an aircraft, comprising:

an airborne horizontal scanning radar apparatus that periodically scans along a generally horizontal plane;

a processor that determines a weather event based upon reflectivity readings from the horizontal scanning radar apparatus, the processor further generating a first shape descriptor representative of the weather event as detected along the generally horizontal plane;

an airborne vertical scanning radar apparatus that scans along a vertical plane, the vertical plane having a bearing corresponding to a predetermined part of the first shape descriptor, wherein the processor generates a second shape descriptor representative of the weather event as detected along the vertical plane, and further wherein the processor generates a three-dimensional model of the weather event using the first and second shape descriptors; and

a display, upon which is rendered a three-dimensional shape that is based upon the three-dimensional model.

Claim 20 (currently amended) The airborne weather radar system of claim 19, further comprising a transceiver configured to receive ground-based weather radar information, wherein the processor incorporates the ground-based weather radar information into the generation of the three-dimensional model of the weather event.